

REMARKS

By this amendment, applicant has amended the specification to insert appropriate headings therein and to provide a brief description of the figure. Applicant has also amended the claims to more clearly define his invention. In particular, claims 1 - 6 have been amended to eliminate the indefiniteness problems noted by the Examiner in numbered section 2 of the office action. Claim 1 has also been amended to clarify that the pulp fibers are loose fibers and has amended claim 4 to clarify the device to apply the pulp fibers in an air-lay device.

In view of the foregoing amendments to the claims, applicant submits all of the claims now in the application comply with the requirements of 35 USC 112, second paragraph. Therefore, reconsideration and withdrawal of the rejection of claims 1 - 6 under 35 USC 112, second paragraph, are requested.

Claims 1 - 5 stand rejected under 35 USC 102(e) as allegedly being anticipated by United States Patent No. 6,177,370 to Skoog et al. Claim 6 stands rejected under 35 USC 103(a) as being unpatentable over Skoog et al. Applicant traverses these rejections and requests reconsideration thereof.

The present invention relates to a method of producing a composite non-woven for receiving and storing liquids and to a device for accomplishing the method. The method of the present invention includes the steps of providing a carrier nonwoven, consolidating the carrier nonwoven, applying a thin micro fiber intermediate layer to the consolidated carrier nonwoven, applying loose pulp fibers to the intermediate layer and interconnecting at least the pulp fibers and the intermediate layer. The device includes, as shown by way of example only in the figure, in a continuous plant, a web laying device 1-4 to produce a carrier nonwoven, a meltblowing device 7 to apply a fine intermediate layer formed from micro-fibers on

the carrier nonwoven, a device 8, such as an air-lay device, to apply pulp fibers to the intermediate layer, and a water needling device 11 to connect at least the pulp fibers to the microfibers.

In the prior art, hydraulic needling of pulp fibers with a consolidated carrier nonwoven has resulted in a high loss of pulp fibers. Since the pulp fibers are washed out of the fabric, they are lost and the efficiency of the product and process reduced. Since the pulp fibers can get into the filtration unit necessary in the case of water needling, there is an increased outlay for the purification of the recycled water. The present invention solves these problems by a method and device which provides a fine intermediate layer of microfibers between the pulp fibers and the carrier nonwoven prior to interconnecting.

In Skoog et al, an alternative embodiment is shown in Figure 3 in which the fabric 100 includes three zones, namely, a synthetic fiber structure first zone 120, a synthetic fiber structure second zone 140, and a short fiber third zone 160. In this embodiment, the zones 120 and 140 include, respectively, a first spunbond web layer and first meltblown web layer 128, and a second spunbond web layer 144 and a second meltblown web layer 148. While the Examiner alleges the Skoog et al patent to teach that the meltblown layer has fibers which are attenuated to form super-fine fibers, it is submitted the Skoog et al patent does not contain such a teaching. Rather, at column 2, lines 7 - 23, the Skoog et al patent defines the term "meltblown web," and refers to several patents and publications, including two publications referring to super-fine fibers and to United States Patent No. 3,849,241. A review of United States Patent No. 3,849,241 indicates that the meltblown process can provide fibers of a diameter of 0.5 to 400 microns. See, column 4, lines 56 - 60

of this patent. Accordingly, the meltblown web may or may not be a web made from microfibers, as presently claimed.

Moreover, as shown in Figure 4 of Skoog et al, the method and apparatus of Skoog et al supply a short fiber suspension, such as pulp, from a head box 212 via a sluice 214 which is deposited onto a forming fabric 216. Removing water from the suspension forms a uniform zone or layer of cellulosic material 218 which is then placed between two synthetic fiber structure zones or layers 224 and 226, as described at column 9, lines 28 to 40 of Skoog et al. On the other hand, according to the method of the present invention, the method includes the step of applying loose pulp fibers to the intermediate layer; according to the device of the present invention, the device includes an air-lay device to apply the pulp fibers. Such is neither disclosed nor suggested by Skoog et al.

For the foregoing reasons, claims 1 - 5 are patentable over Skoog et al.

Claims 1, 2 and 4 stand rejected under 35 USC 102(b) as allegedly being anticipated by United States Patent No. 5,413,849 to Austin et al. Applicant traverses this rejection and requests reconsideration thereof.

The patent to Austin et al discloses a composite elastic nonwoven fabric including a plurality of longitudinally extending elastomeric filaments and at least one fibrous web including staple fibers and anchoring fibers entangled with the elastomeric filaments. The Austin et al patent discloses a device and method for making such a fabric in Figure 1 in which a carded layer 8 is first formed, including synthetic or natural staple fibers and anchoring fibers. A conventional melt spinning apparatus 14 forms a second layer comprising a plurality of substantially continuous elastomeric filaments 16 onto the carded layer 8 to form a two layer structure 22. A second carding apparatus 24 deposits a second carded fibrous layer 26, also

preferably comprising staple and anchoring fibers, onto the composite layered structure 22 to form a three layer composite structure 28 which is hydroentangled.

While the Examiner alleges the intermediate layer 16 to be a meltblown web, it is submitted this allegation is in error. Rather, reference numeral 16 refers to the substantially continuous elastomeric filaments provided by the melt spinning apparatus 14. Thus, layer 16 does not comprise microfibers, but substantially continuous elastomeric filaments. The layer 16 is further described at column 9, line 9, et. seq. of Austin et al and is not described to comprise meltblown fibers. Rather, at column 6, lines 36 - 39 of Austin et al, it is disclosed that the anchoring fibers (which are disclosed to be included in the fibrous web 8 and the second carded fibrous layer 26) can be provided as wood fibers, meltblown fibers, flash spun fibers, and the like. Therefore, it is presumed that the reference to meltblown microfibers at column 12, lines 45 to 52 of Austin et al, to which the Examiner refers, refers to the anchoring fibers in the carded fibrous layers 8 and 26, not to the continuous elastomeric filaments 16.

Moreover, in Austin et al, while the fibrous webs 8 and 26 (or 62 and 64) can include pulp fibers, the pulp fibers are part of the web and are not applied as loose fibers as in the method of the present invention. Moreover, the apparatus of Austin et al does not include an air-lay device for applying pulp fibers, as does the device of the present invention.

For the foregoing reasons, the Austin et al patent does not disclose the presently claimed invention.

Claims 1, 2 and 4 stand rejected under 35 USC 102(b) as allegedly being anticipated by United States Patent No. 5,620,785 to Watt. Applicant traverses this rejection and requests reconsideration thereof.

The patent to Watt et al discloses a nonwoven disposable face mask which includes a meltblown web 10 having microfine fibers 12. The mask includes at least two opposing outer layers 18 and 20 which sandwich meltblown web 10, the layers being bonded together to form a coherent fabric by thermal bonding, mechanical interlocking, adhesive bonding, and the like. Layer 18 is an absorbent layer comprising a mixture of thermoplastic staple fibers and absorbent fibers. Layer 20 is a cover layer that can be a nonwoven web comprising thermoplastic staple fibers or, alternatively, formed of substantially continuous spunbonded filaments. According to the method and device disclosed in Watt et al, the meltblown web is sandwiched between pre-formed webs 18 and 20 as shown in Figure 5. Accordingly, the Watt et al patent does not disclose the method of the present invention, including applying loose pulp fibers to an intermediate layer. Rather, in Watt et al, webs of fibers are applied to the meltblown layer. In addition, the Watt et al patent does not disclose the device of the present invention including the use of an air-lay device for applying pulp fibers. Accordingly, the presently claimed invention is patentable over Watt et al.

Applicant notes the Examiner has cited a number of documents as being pertinent to applicant's disclosure. However, since these documents were not applied in rejecting claims formerly in the application, further discussion of these documents is deemed unnecessary.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli,

Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 865.41190X00),  
and please credit any excess fees to such deposit account.

Respectfully submitted,

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